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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,742	09/28/2006	Shigeya Naritsuka	070456-0153	4940

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EXAMINER	
SAYADIAN, HRAYR	
ART UNIT	PAPER NUMBER
2814	
MAIL DATE	DELIVERY MODE
02/15/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,742	NARITSUKA ET AL.	
	Examiner	Art Unit	
	HRAYR A. SAYADIAN	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,9,10 and 12* is/are pending in the application.

4a) Of the above claim(s) *3,6,9 and 10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED OFFICE ACTION

Unity of Invention

1. The 6/25/2010 and 2/9/2010 elected without traverse inventions of claims 1, 2, 4, 5, 8, 11, and 12. The 9/1/2010 Office Action made final the Lack of Unity Requirement. The Lack of Unity of Invention Requirements and their finality are proper and they are therefore maintained.

35 U.S.C. § 103 Rejections of the Claims

2. The text of the appropriate paragraph(s) of 35 U.S.C. § 103(a), providing the legal basis obviousness rejection(s) in this Office Action, can be found in a previous Office Action.

3. Claims 1, 4, and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over WO Publication No. WO03/105295 (Published February 6th, 2003; PGPUB US 2004/0206975 for an application by "Tojo" is given as the equivalent English translation) in view of PGPUB US 2001/0042503 for a patent application by "Lo," "LPE Lateral Overgrowth of GaP," "Zhang," Japanese Journal of Applied Physics, Vol. 29, p245 (1990), and U.S. Pat. No. 5,751,013 to "Kidoguchi."

Tojo discloses all of the limitations of the claims, including a GaP Substrate (1, see paragraphs [0024] and [0040]), an active layer (5; see, paragraph [0040]), and an ELO layer (2; see paragraph [0040]) between the active layer and the substrate.

And Tojo discloses a growth supporting layer located (the series of disconnected rectangles shown in the front page figure, for example) under and in contact with the ELO layer 2, and discloses the ELO layer filling (at least above) a window (opening) portion in the growth supporting layer, and discloses the ELO layer growing laterally abutting on the growth supporting layer. The apertured layer between the GaP substrate 1 and the ELO layer 2 is growth supporting layer because as well known in the art, an apertured layer both inhibiting vertical growth over the non-apertured portion and promoting ELO growth from the apertured portion and supporting the ELO growth over

the non-apertured portion is the method for ELO growth, which is the structure and method Tojo discloses.

Tojo appears to fail to explicitly disclose the growth-supporting layer being SiO2.

The art however well recognizes that SiO2 is a suitable material for use as growth supporting material on GaP. See, for example, the Abstract of Zhang.

According to well-established patent law precedents (See, for example, M.P.E.P. § 2144.07), therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention of this application to have used the prior art disclosed SiO2 as the growth supporting layer, as taught to be suitable by Zhang.

Tojo discloses using a GaN ELO layer in a nitride based light emitting device, but fails to explicitly disclose making the ELO comprise AlGaAs with the substrate being GaP or when the light emitting device is AlGaInP based to achieve desired emission wavelength. This feature would have been obvious however when making the light emitting device other than Nitride based or when making the substrate GaP at least to insure better lattice matching with the GaP substrate or the non-GaN based light emitting device.

Specifically, Lo teaches using AlGaAs buffer dislocation confining layer over a GaP substrate for an AlGaInP light emitting device. See [0046].

Therefore, it would have been obvious for one of ordinary skill in the art at the time of this invention to have modified the GaN buffer in Tojo to be AlGaAs when implementing the structure in an AlGaInP light emitting device, as taught by Lo, wherein the AlGaAs layer would be the ELO layer.

Tojo appears to fail to explicitly disclose the active layer including an n-type layer and a p-type layer of a compound semiconductor.

This feature however is well known in the art.

For example, Kidoguchi, column 9, line 59 to column 10, line 2, teaching using alternating n and p doped layers within the active layer so that "electrons and holes are spatially separated from each other. Therefore, the recombination probability increases and the emission efficiency is enhanced by an order of magnitude compared with the case where electrons and holes are not spatially separated from each other."

Therefore, it would have been obvious for one of ordinary skill in the art at the time of this invention to have modified the active layer Tojo teaches so that it includes alternating n and p-type layers to enhance the emission efficiency, as Kidoguchi teaches.

With respect to claim 4, Tojo discloses the growth-supporting layer in contact with the substrate.

With respect to claim 5, Tojo discloses the window portion being arranged linearly and having a pattern that is periodic.

4. Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over "Tojo" in view of "Lo," "Zhang," and "Kidoguchi," further in view of PGPUB US 2004/0183090 for a patent application by "Kitaoka" and U.S. Pat. No. 5,217,564 to "Bozler."

Tojo discloses using MOCVD and the like to grow the nitride layers, but fails to explicitly disclose using LPE to grow the ELO layer.

The art however recognizes that LPE is usable in addition to MOCVD and the like growth methods to grow ELO layers. See, for example, Kitaoka, paragraph [0008]. And see, Bozler, column 26, lines 31-53.

And according to patent law precedents (see, M.P.E.P. § 2144.06; combining or substituting features known to be equivalent for a specific purpose) it would be prima facie obvious to combine or substitute equivalents.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention of this application to have used LPE in addition to MOCVD or instead of MOCVD to grow the ELO layer, as taught by Kitaoka and Bozler.

Response to Arguments

5. The arguments in the 12/1/2010 "Reply" to the 9/1/2010 "Office Action" have been fully considered. These arguments however are moot in view of the new rejection(s).

The Reply argues that the prior art references fail to disclose the ELO layer being AlGaAs.

In response, it is noted the rejection of the claims specifically explain how the prior art would have rendered the claims obvious, including the feature of AlGaAs ELO, as now recited in the independent claim.

The Reply also argues that Tojo does not name the apertured layer between the substrate and the ELO layer to be an ELO growth-supporting layer.

In response, it is noted that the apertured layer between the substrate and the ELO layer would be the ELO growth supporting layer by the function it performs being apertured and below the ELO layer, as explained above in rejecting the claims.

Accordingly, rejecting the claims as being unpatentable over the prior art is proper. And the rejection of the claims over the prior art therefore is maintained.

CONCLUSION

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS OFFICE ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a).

A shortened statutory period for reply to this Office Action is set to expire THREE MONTHS from the mailing date of this Office Action. Extension of this time period may be granted under 37 CFR § 1.136(a). **The maximum period for reply, however, is SIX MONTHS from the mailing date of this Office Action**.

If a first reply is filed within TWO MONTHS of the mailing date of this Office Action and the advisory Office Action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory Office Action is mailed, and any extension fee pursuant to 37 CFR § 1.136(a) will be calculated from the mailing date of the advisory Office Action.

Any inquiry concerning this communication or earlier communications from an Examiner should be directed to Examiner Hrayr A. Sayadian, at (571) 272-7779, on Monday through Friday, 7:30 am – 4:00 pm ET.

If attempts to reach Mr. Sayadian by telephone are unsuccessful, his supervisor, Supervisory Primary Examiner Wael Fahmy, can be reached at (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available only through Private PAIR. For more information about the PAIR system, see http://pair-direct.uspto.gov. The Electronic Business Center (EBC) at (866) 217-9197 (toll-free) may answer questions on how to access the Private PAIR system.

/Hrayr A. Sayadian/
Primary Examiner, Art Unit 2814
1-571-272-7779